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ABSTRACT

The University of California at Davis's (UC) Agricultural Experiment Station (AES) was used as a case study for purposes of examining how one Land Grant Institution responded to charges that its research had not followed the mandate of the Hatch Act of 1887. Focusing on "rural, noncommercial" research, data were analyzed for fiscal years 1970-71 through 1973-74 relative to: the U.S. Department of Agriculture's Goal VIII: Assist Rural Americans to Improve Their Level of Living; and UC's Category Three--People Oriented Research (Consumer, Family, and Community). Although in 1971 UC appointed a nine-man reappraisal committee, the research clarification and classification established at that time did not, when viewed in terms of scientist manyears and dollar support allocation, achieve the desired impact. It was concluded that the small increase in rural noncommercial research was due to: (1) size and composition of the AES personnel; (2) lack of department focal point for addressing rural, noncommercial concerns; (3) lack of an identifiable rural, noncommercial public; (4) dissemination problems with rural noncommercial research findings. Suggestions for improvement were development of: manpower versed in public policy considerations; increased dollar support; a refined focal point; and non-traditional research dissemination techniques. (JC)

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RURAL NON-COMMERCIAL RESEARCH

THE UNIVERSITY OF CALIFORNIA: A CASE STUDY

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Rural Non-Commercial Research

The University of California: A Case Study[1]

ABSTRACT

This paper uses the University of California's Agricultural Experiment Station as a case study of how one Land Grant institution responded to charges that its research was not following the mandate of the Hatch Act of 1887. Data presented covers the fiscal years 1970-71 through 1973-74 and focuses on what is referred to as "rural, non-commercial" research. This encompasses research contained under (a) the USDA's Goal VIII: Assist Rural Americans to Improve their Level of Living, and (b) the University of California's Category (3): People-Oriented Research--Consumer, Family, and Community. The scope of the paper views general changes in research dollar allocation and scientific manyear employment occurring over the four year period. The data suggest that for rural non-commercial research to survive in a University setting structural change and the development of, and adherence to, priorities in the Agricultural Experiment Station are essential.

Rural Non-Commercial Research

The University of California: A Case Study

This year the University of California is celebrating its hundredth year of agricultural research service to the people of California. In our view this seems an appropriate time for examination of the events which have influenced the University's Agricultural Experiment Station's move toward "rural, non-commercially" related research and service.

This paper will specifically examine what is called "rural, non-commercial" research. This term includes research done under (a) the USDA's Goal VIII: "Assist Rural Americans to Improve their Level of Living;" and (b) the University of California's Category (3): "People-Oriented Research--Consumer, Family, and Community."[2]

The intended primary objective of such research is that "the general public" should benefit from it. The "public" may be consumers, residents of rural areas, or the family unit.

The research areas cover such topics as food choices, ensuring toxic-free food products, causes of poverty among rural people, and human nutrition among others.

Since both the USDA and University of California sources use the Research Problem Areas (RPA's) as the "building blocks" for their respective classification systems this paper can be compared with data from other Land Grant institutions to see how the University of California stands in relation to other State Agricultural Experiment Stations (SAES) in rural non-commercial research.

Background and Issues

The University of California's Agricultural Experiment Station (AES) . been in existence for over seventy-five years, and has expanded to presently

include facilities on the Berkeley, Davis, and Riverside campuses in addition to nine field stations scattered throughout the State. In Fiscal year 1971 the AES employed 908 individuals (USDA, 1971: 13-23) completing 523.5 scientific manyears of work[3] on a research budget of $31,355,119.[4]

Over the past seventy-five years the State's population has grown from 1,485,053 (1900) to 19,953,134 (1970); and the rural-urban shift has been just as dramatic. In 1900 47.7% of the population was classed as rural - by 1970 the rural segment made up only 9.1% of the State's total population (USDC, 1973:7).

For the period since 1970 additional data is available on California's farm sector:

TABLE 1

Number of Farms, Land in Farms, and Size of Farms 1950-1975

Year	No. of Farms	Land in Farms (000 acres)	Av. Size of Farm (acres)
1970	64,000	36,800	575
1971	64,000	36,600	575
1972	63,000	36,400	578
1973	63,000	36,200	575
1974	63,000	36,100	573

Source: California Department of food & Agriculture, Crop and Livestock Reporting Service, January 1975.

During the 1960's and early 1970's concerns arose from outside the Land Grant institutions regarding the kinds of agricultural research being conducted by the state agricultural experiment stations (Draper, 1968; Fellmeth, 1971; Hightower, 1972; and Watson et al., 1972). Section 2 of the Hatch Act of 1887 established the agricultural experiment stations with the following mandate:

> "It is further the policy of the Congress to promote the efficient production, marketing, distribution, and utilization of products of the farm as essential to the health and welfare of our peoples and to promote a sound and prosperous agriculture and rural life as indispensable to the maintenance of minimum employment and national prosperity and security. It is also the intent of Congress to assure agriculture a position in research equal to that of industry, which will aid in maintaining an equitable balance between agriculture and other segments of our economy. It shall be the object and duty of the State Agricultural Experiment Stations through the expenditure of the appropriations hereinafter authorized to conduct original and other researches, investigations, and experiments bearing directly on and contributing to the establishment and maintenance of a permanent and effective agricultural industry of the United States, including researches basic to the problems of agriculture in its broadest aspects, and such investigations as have for their purpose the development and improvement of the rural home and rural life and the maximum contribution by agriculture to the welfare of the consumer, as may be deemed advisable, having due regard to the varying conditions and needs of the respective states" (USDA, 1970a: 15 emphasis added).

Notwithstanding this mandate, much of the criticism centered around the issue of who the main bneficiaries of such research were. In the words of the Associate Director of the U. C. Davis Agricultural Experiment Station:

> "What has happened in the twentieth century is that the Land Grant establishment has redefined its mission to be primarily production agricultural efficiency rather than the much broader charge contained in the Hatch Act. Thus, rather than perceiving the general public, particularly those that are 'disadvantaged,' as our clientele we have given special attention to production agriculture. But even more restrictive, we have tended to identify with successful production agriculture" (McCalla, 1973: 1001).

Others from within the Land Grant complex also voiced concern over the quality and direction of state Agricultural Experiment Station research. Studies such as the Report by the Association of State Universities and Land

Grant Colleges/USDA on agricultural research (1966), the Pound Committee Report (National Research Council, 1972), and papers by Copp (1972), Ford (1973) and Tefertiller (1973) suggested that the Land Grant institutions redirect research "to assist rural areas in reaching social and economic goals" (Tefertiller, 1973: 776).

The University of California's Response: Reorganization of Agricultural Experiment Station Research[5]

As a response to public and academic concerns voiced over the uses of agricultural research, the U.C. Vice President of Agricultural Sciences, James B. Kendrick, in 1971 appointed a nine-man reappraisal committee (consisting of the five Associate Directors of the Experiment Station, three campus Chancellor's Office representatives and the Director-designate of the Experiment Station) to look at AES research and project its programmatic thrust through fiscal year 1977.

The committee acknowledged the need for a re-examination of Experiment Station research:

> "Although called the 'people's colleges,' the agricultural colleges' direct focus has been primarily on things - soil, water, plants, and animals - under the unstated assumption that if these were properly looked after and handled efficiently, human welfare on farms would be served. In a way, this philosophy flows from the basic American dream of the opportunity to get ahead under a fair set of rules. Yet the recent advances of science and technology have themselves caused problems for people that are not soluble simply by more and better technology" (University of California, 1972: 3-4).

The result of their reappraisal was a clarification of what they considered "research:"

> "...we recognize three general types of research that are undertaken by scientists in the Agricultural Experiment Station.

These are: (1) disciplinary research, that which programmatically is oriented toward enhancing knowledge in a particular branch of learning; (2) individually-motivated, problem-solving research which is consistent with the overall mission of the unit and not disciplinary in character; and (3) mission-oriented, programmatic research which is usually characterized as problem-solving or highly goal-oriented research requiring the efforts of several scientists or a team" (University of California, 1972: 6).

Secondly, they reclassified research into four general categories:[6]

Category (1) Natural Resources and Environmental Quality

Category (2) Commercial Agriculture--Production, Processing, and Marketing

Category (3) People-Oriented Research--Consumer, Family, and Community

Category (4) Disciplinary Research

And thirdly, they projected major manpower changes in Category (3) research over the following five years:

The total projected change for all research areas in Category (3) was an increase of 26.5 Scientist Manyears (a 56% increase) - from 47.5 to 74 SMY's.

TABLE 2

Scientist Man-Year Allocations by Research Program Goals and Units

	1970-71 Total	1970-71 Davis	Projected State Plan Total	Projected State Plan Davis	% Change
CATEGORY (1) NATURAL RESOURCES AND ENVIRONMENTAL QUALITY					
I Renewable Natural Resource Conservation and Management					
A. Improvement of Quality and Quantity of Forest and Range Production	9.6	3.1	17	3	+ 77
B. Inventory and Appraisal of Land, Air, and Water Resources	25.0	14.4	18	9	-28
C. Conservation and Management of Land, Air, and Water Resources	18.2	14.0	28	19	+ 54
Subtotal - Goal I	52.8	31.5	63	31	+ 19
II Environmental Enhancement and Recreation					
A. Management of Wildlife and Fisheries	7.9	6.5	11	9	+ 38
B. Outdoor Recreation	3.4	1.4	7	4	+ 105
C. Using Plants to Enhance the Environment	17.4	10.1	15	8	-14
D. Environmental Pollution	20.8	5.6	30	13	+ 44
Subtotal - Goal II	49.5	23.6	63	34	+ 27
Subtotal - Category (1)	102.3	55.1	126	65	+ 23
CATEGORY (2) COMMERCIAL AGRICULTURE, PRODUCTION, PROCESSING, AND MARKETING					
III Production Capacity and Efficiency of Domestic Plants and Animals					
A. Physical and Economic Aspects of Production Systems	15.4	9.4	26	18	+ 69
B. Improvement of Quality and Quantity of Field, Fruit, and Vegetable Crops	82.9	49.9	63	39	- 24
C. Improvement of Quality and Quantity of Domestic Animal Production	27.4	26.5	26	26	- 5
Subtotal - Goal III	125.7	85.8	115	83	- 8.5
IV Product Improvement and Marketing					
A. Analysis of Market Demand and Market Performance	9.6	6.8	9	7	- 8
B. Product Improvement -- Processing, Storage, and Standards	37.3	21.8	33	21	- 11.5
Subtotal - Goal IV	47.1	28.6	42	28	- 10.8
V Protection of Plants and Animals					
A. Control of Insects Affecting Plants	32.1	8.3	30	7	- 6.5
B. Control of Plant Diseases	32.7	13.5	30	12	- 8.3
C. Protection of Domestic Animals and Wildlife	9.7	7.3	14	12	+ 44
D. Control of Weeds and Wildfire	8.6	5.0	10	5	+ 15
Subtotal - Goal V	83.1	34.1	84	36	- 1
Subtotal - Category (2)	255.9	148.5	241	147	-5.8
CATEGORY (3) PEOPLE-ORIENTED RESEARCH -- CONSUMER, FAMILY, AND COMMUNITY					
VI Family and Consumer Welfare					
A. Consumer Choice	4.7	4.7	8	8	+ 70
B. Health and Safety	19.0	8.5	21	9	+ 10.5
C. Food and Nutrition	16.4	3.9	24	8	+ 46
Subtotal - Goal VI	40.1	17.1	53	25	+ 32
VII Community and Economic Development					
A. Foreign Economic Development	0.3	0.2	1	1	+ 233
B. Regional and Community Economic Development	7.1	4.9	20	16	+ 182
Subtotal - Goal VII	7.4	5.1	21	17	+ 184
Subtotal - Category (3)	47.5	22.2	74	42	+ 56
CATEGORY (4)					
VIII Disciplinary Research					
A. Disciplinary Research	117.8	56.0	84	36	- 28.6
TOTAL - Goals I - VIII	523.5	281.8	525	290	+ .29

Post-Reorganization: The Period 1971 through 1974

What changes have occurred in rural (e.g., Goal VIII) non-commercial (e.g., Category (3)) research by the Agricultural Experiment Station over the past four years? Table 3 answers these questions in terms of dollar support allocated, and scientist manyears devoted, to rural non-commercial research:

TABLE 3

Comparison of Total A.E.S. Commitment with rural (Goal VIII) and non-commercial [Category (3)] Research by

(a) Dollar support given

Year	Total AES $ Support	Goal VIII Support	(% Total)	Category (3) Support	(% Total)
970-71	$ 31,355,119	$ 250,960.	.8%	$ 2,804,205	8.9%
971-72	32,150,055	307,070	.95%	3,192,896	9.9%
972-73	37,939,073	371,897	.98%	3,836,857	10.1%
973-74	40,283,028	330,831	.82%	4,327,994	10.7%

(b) Scientific manyears devoted

Year	Total AES Manyears	Goal VIII Manyears	(% Total)	Category (3) Manyears	(% Tota
1970-71	523.5	5.1	.97%	47.5	9.1%
1971-72	483.7	5.8	1.20%	44	9.1%
1972-73	484.2	5.5	1.10%	45.4	9.4%
1973-74	556.6	6.23	1.10%	56.4	10.1%

Source: Compiled from data obtained from the Office of the Vice President, Agricultural Sciences of the University of California, Berkeley, California.

As indicated above, Category (3) research has indeed increased over the past four years--both in terms of dollar support allocated (a 54.3% rise) and in scientist manyears employed (an 18.7% increase). Goal VIII research also increased in both departments (dollar support went up by 31.8%, and scientist manyears were up 22.2%). However, such data is rather meaningless if it is not placed in the context of the total California Agricultural Experiment Station change during the same period. Table 4 indicates the dollar and manpower changes for all four categories during the past four years. More importantly, the changes are expressed in both relative and absolute figures:

TABLE 4

Relative and Absolute Changes in California A.E.S. dollar support and SMY's over the period 1970-1971 through 1973-1974 by Categories

Category	1970-1971		1973-1974		Relative Change		Absolute Change	
	$	SMY	$	SMY	$ (%)	SMY (%)	$	SMY's
(1) Natural Resources & Environmental Quality	5,911,747	102.3	9,556,323	126.2	62%	23.4%	3,644,576	23.9
(2) Commercial Agriculture: Production, Processing, and Marketing	16,254,861	255.9	19,029,652	270.8	17%	5.8%	2,774791	14.9
(3) People-Oriented Research: Consumer, Family, and Community	2,804,205	47.5	4,327,994	56.4	54.3%	18.7%	1,523,789	8.9
(4) Disciplinary Research	6,384,306	117.8	7,369,059	103.2	15.4%	-12.4%	984,753	-14.6
TOTALS:	31,355,119	523.5	40,283,028	556.6	28.5%	6.3%	8,927,909	33.1

Source: Compiled from data obtained from the Office of the Vice President, Agricultural Sciences of the University of California, Berkeley, California

The table shows that the only Category that changed according to the Plan was Category (1): Natural Resources and Environmental Quality. While Category (2): Commercial Agriculture - Production, Processing, and Marketing was projected to decrease 5.8% it, in actuality, increased 5.8%. And the 28.6% decrease in Category (4): Disciplinary Research did not materialize either (It lost only 12.4%). Meanwhile Category (3): People-Oriented Research--Consumer, Family, and Community increased not by 56%, but only by 18.7%. And, when taken in the context of the total AES manpower figures for 1973-74, the absolute percentage growth in Category (3) manpower has been only 1% (from 9.1% to 10.1% of the total AES manpower).

Thus the desired impact was not achieved. The Experiment Station's manpower emphasis was not shifted from Commercial agriculture to People-Oriented research.

Tentative Variables for the Small Increase in Rural Non-Commercial Research by the University's Agricultural Experiment Station

1. Size and Composition of the A.E.S. personnel

In 1970-71 the Agricultural Experiment Station contained 908 researchers (USDA, 1971: 13-23). By 1974-75 the figure had increased to 923 (USDA, 1975: 9-16), or a net gain of only 15 new researchers over the four year period. If the projected increase in Category (3) research is to be meaningful Rural Sociologists and Community Developers must be a part of this actual manpower increase, as they are the scientists who can conduct research relevant to this category - however, this has not been the case.

In 1970-71 the Agricultural Experiment Station contained three researchers with the title of "Rural Sociologist" (USDA, 1971: 13-23). This number was

unchanged in 1974-75 (USDA, 1971: 9-16). In the same period researchers with "Community Developer" titles increased from 1 to 2 (USDA, 1975: 9-16). This small number of "Rural Sociologists" and "Community Developers" is not atypical for most SAES (Smith, 1973: 668); however, in light of the fact that the California Agricultural Experiment Station is the largest AES in the country we would suppose the University would employ more of such people - especially when viewed in terms of the 1972 Reorganization plan for Category (3) research:

> "A major change is projected for this area. It is one in which the Experiment Station has historically expended a small proportion of its research effort. Current social pressures are evidence that much more study is needed on the problems of individuals and families as consumers and as members of communities in which the supply and delivery of social services may be inadequate" (University of California, 1972: 19).

From the data summarized above we conclude that at the present time the University's commitment to rural non-commercial research appears to be more verbal than actual. For the most part, the same individuals are doing the same kinds of research for which they have the background, success and technical training.

2. Lack of a Department Focal Point for addressing Rural Non-Commercial Concerns.

None of the three U.C. campuses housing Agricultural Experiment Station personnel at present has a Department of Rural Sociology or Community Development. What Rural Sociologists and Community Developers there are in the CAES are housed in either the Departments of Agricultural Economics at Berkeley and Davis, which traditionally have been more production, processing, and marketing oriented (Holland and Redman, 1974: 787), or, in the Department of Applied Behavioral Sciences at Davis.

One possible improvement in this regard is the ongoing effort to launch a Masters program in Community Development on the Davis campus. This research program was proposed in the 1972 Reorganization plan to commence by July 1, 1975 (University of California, 1972: 27); however, it took a year longer than anticipated to identify the Associate Dean who was to be in charge of this program - so the July 1 target date is at best tenuous. (The Masters program is presently scheduled to begin in September 1976.)

3. Lack of an Identifiable Rural Non-Commercial Public that is to be Served.

Whereas it is relatively easy to identify the "publics" served through commercial agricultural research done at the California Agricultural Experiment Station[7] - the rural non-commercially oriented "public" is difficult to categorize.

One of the first tasks undrtaken by the staff of a Davis Campus Experiment Station project on the "Social Implications of Agricultural Research" was a 1973 one-day conference which brought together various publics not traditionally served by the Agricultural Experiment Station. Those present ranged from organic farmers, consumer cooperativists, and ecology groups to the National Farmers Union and the Center for Rural Studies. Their comments emphasized the lack of attention paid to their needs by the AES.

In summarizing the day's activities Professor Isao Fujimoto attempted to put the research issue into the context of the University:

> "...There are other aspects concerning the resources, priorities, and claims on the University system that may not be... clear. Neither is it clear who, how, where, and whether the kinds of questions raised by the various publics represented here today can be channeled into the University and challenge

> interested scientists, given the nature of rewards, and the social and political context of how any given kind of work--including scientific research--is responded to, investigated, and disseminated" (Fujimoto, 1973: 36).

For any change to take place the mere definition of just who our rural non-commercial audience is will not be enough. The funding for research is not initiated by such people; rather, it comes from the USDA and other Federal agencies who have already decided what kinds of rural research projects are appropriate and necessary for Agricultural Experiment Station personnel.

The need for agricultural research policy to reflect input from those people affected by such research has been pointed out by Tefertiller (1973: 771, Ford (1973: 380-8k), and McCalla (1973: 1001). However, unless an organized constituency is developed and/or pressure is forthcoming from funding sources, State Agricultural Experiment Station policy will not change.

4. Dissemination Problems with Rural Non-Commercial Research Findings.

Much has been spoken and written about the "publish or perish" nature of Land Grant institutions. The University of California's advancement process rests heavily on research and peer reviewed publications. For the University's AES as a whole the Research:Teaching ratio approaches 70:30 - which means that (in general) 70% of an AES person's job is defined as research. It is this research which figures greatly in any decisions involving promotion or tenure.

The essential key to research acceptance (in academic terms) is publication in refeered journals; and, almost without exception, research reported on through other channels (such as monographs, conference reports, working on legislative bills, or using newsletters) is not counted as acceptible in the promotion process (Nolan and Heffernan, 1974: 538; Ford, 1973: 385).

This raises the question: "Is the University really trying to reach its rural audience?" The answer is "No." We would venture to say that very few people comprising the rural audience would find technical, refereed journals of much use.

Secondly, by the time research sent to such journals is actually published, at least one year will have elapsed. By the tine the research findings are widely disseminated they may be irrelevant!

Conclusion

In the course of developing this paper we noticed the concern expressed that rural non-commercial research be strengthened.

The California Agricultural Experiment Station example indicates that such will not occur if (1) new manpower versed in public policy considerations is not brought into the research process; (2) University dollar support is not greatly expanded in such areas; (3) a focal point for rural research is not established somewhere in the Agricultural Experiment Station; and (4) the administrative structure does not change to allow non-trational types of research dissemination to be used and counted as acceptable research.

We feel that for such rural researchers to survive in a University setting a structural change in the Agricultural Experiment Station is necessary. If the A.E.S. does not accommodate research in this area, then in the words of Thomas Ford (1973: 383): "A profession that fails to demonstrate how its particular knowledge contributes to social ends runs the grave risk of having its knowledge ignored and ultimately its public sanction revoked."

FOOTNOTES

[1] The authors wish to acknowledge the support given them by Isao Fujimoto. This paper is drawn from a portion of the data compiled in the course of his Agricultural Experiment Station project entitled: "The Social Implications of Agricultural Research" (S.I.R.); and discusses in general terms a segment of which will be reported upon at length and in detail when the project report is completed.

[2] This discussion presupposes one's knowledge of how the USDA and most Land Grant institutions classify agricultural research. The USDA has nine goals under which are contained topical areas which contribute to each goal. These topical areas are referred to as Research Problem areas (RPA's) and are the basis for what is discussed in this paper as Goal VIII and Category (3) research. Listed below are the RPA's included under each of the two classification systems:

Goal VIII: Assist Rural Americans to Improve their Level of Living

801	Housing
802	Individual and Family Decision Making and Resource Use and Family Functioning
803	Causes of Poverty among Rural People
804	Improvement of Economic Potential of Rural People
805	Communication and Education Processes
806	Individual and Family Adjustment to Change
807	Structural Changes in Agriculture
808	Government Programs to Balance Farm Outputs and Market Demand

Category (3): People-Oriented Research: Consumer, Family, and Community

507	Competitive Interrelationships in Agriculture
602	Evaluation of Foreign Food Aid Programs
603	Technical Assistance to Developing Countries
701	Insure Food Products free of Toxic Contaminants including Residues from Agricultural and other Sources
702	Protect Food and Feed Supplies from Harmful Microorganisms and Naturally occurring Toxins
703	Food Choices, Habits, and Consumption
704	Home and Commercial Food Service
705	Selection and Care of Clothing and Household Textiles
706	Control of Insect Pests of Man and his Belongings
707	Prevent Transmission of Animal Diseases and Parasites to Man
708	Human Nutrition
709	Reduction of Hazards to Health and Safety
801	Housing
802	Individual and Family Decision Making and Resource Use and Family Functiong
803	Causes of Poverty among Rural People
804	Improvement of Economic Potential of Rural People

805	Communication and Education Processes
806	Individual and Family Adjustment to Change
807	Structural Changes in Agriculture
907	Improved Income Opportunities in Rural Communities
908	Improvement of Rural Community Institutions and Services

For more information on each of these RPA's turn to the USDA's Manual of Classification of Agricultural and Forestry Research (USDA, 1970: 6). For a listing of all USDA Research Problem Areas turn to Appendix Table 1.

[3] Scientific Manyear is defined as the full time efforts of one scientist plus appropriate support personnel and monetary resources. It is therefore variable by research area.

[4] These figures are compiled from information obtained by the S.I.R. project personnel at the Office of the Vice President, Agricultural Sciences, U.C. Berkeley.

[5] Data for this section is derived from the U.C. Reorganization plan of 1972, and from the Office of the Vice President, Agricultural Sciences, U.C. Berkeley.

[6] For a detailed listing of the RPA's included under each category turn to Appendix Table 2.

[7] First of all because they are organized and have a structure compatible with the University's structure; and secondly, because they provide funds for certain Agricultural Experiment Station projects (During the 1973-1974 year state market order money accounted for $1,401,642 of the University's $40,283,028 budget -- or 3.5% of the total).

APPENDIX TABLE 1

INDEX TO RESEARCH PROBLEM AREAS (RPA'S)

RPA	TITLE
	GOAL I: INSURE A STABLE AND PRODUCTIVE AGRICULTURE FOR THE FUTURE THROUGH WISE MANAGEMENT OF NATURAL RESOURCES
101	Appraisal of Soil Resources .....
102	Soil, Plant, Water, Nutrient Relationships .....
103	Management of Saline and Sodic Soils and Salinity .....
104	Alternative Uses of Land .....
105	Conservation and Efficient Use of Water .....
106	Efficient Drainage and Irrigation Systems and Facilities .....
107	Watershed Protection and Management .....
108	Economic and Legal Problems in Management of Water and Watersheds ..
109	Adaptation to Weather and Weather Modification .....
110	Appraisal of Forest and Range Resources .....
111	Biology, Culture and Management of Forests and Timber-Related Crops.
112	Improvement of Range Resources .....
113	Remote Sensing .....
114	Research on Management of Research .....
	GOAL II: PROTECT FORESTS, CROPS AND LIVESTOCK FROM INSECTS, DISEASES AND OTHER HAZARDS
201	Control of Insects Affecting Forests .....
202	Control of Diseases, Parasites and Nematodes Affecting Forests .....
203	Prevention and Control of Forest and Range Fires .....
204	Control of Insects, Mites, Slugs, and Snails on Fruit and Vegetable Crops .....
205	Control of Diseases and Nematodes of Fruit and Vegetable Crops .....
206	Control of Weeds and Other Hazards to Fruit and Vegetable Crops ....
207	Control of Insects, Mites, Snails, and Slugs Affecting Field Crops and Range .....
208	Control of Diseases and Nematodes of Field Crops and Range .....
209	Control of Weeds and Other Hazards of Field Crops and Range .....
210	Control of Insects and External Parasites Affecting Livestock, Poultry, and Other Animals .....
211	Control of Diseases of Livestock, Poultry and Other Animals .....
212	Control of Internal Parasites of Livestock, Poultry, and Other Animals .....
213	Protect Livestock, Poultry and Other Animals from Toxic Chemicals, Poisonous Plants, and Other Hazards .....
214	Protection of Plants, Animals, and Man from Harmful Effects of Pollution .....

RPA | Title

GOAL III: PRODUCE AN ADEQUATE SUPPLY OF FARM AND FOREST PRODUCTS AT DECREASING REAL PRODUCTION COSTS

301 Genetics and Breeding of Forest Trees .....
302 New and Improved Forest Engineering Systems .....
303 Economics of Timber Production .....
304 Improvement of Biological Efficiency of Fruit and Vegetable Crops ..
305 Mechanization of Fruit and Vegetable Crop Production .....

306 Production Management Systems for Fruits and Vegetables .....
307 Improvement of Biological Efficiency of Field Crops .....
308 Mechanization of Production of Field Crops .....
309 Production Management Systems for Field Crops .....
310 Reproductive Performance of Livestock, Poultry and Other Animals ...

311 Improvement of Biological Efficiency in Production of Livestock, Poultry and Other Animals .....
312 Environmental Stress in Production of Livestock, Poultry and Other Animals .....
313 Production Management Systems for Livestock, Poultry and Other Animals .....

314 Bees and Other Pollinating Insects .....
315 Improvement of Structures, Facilities and General Purpose Farm Supplies and Equipment .....
316 Farm Business Management .....
317 Mechanization and Structures Used in Production of Livestock, Poultry and Other Animals.....
318 Non-Commodity-Oriented Biological Technology and Biometry .....

GOAL IV: EXPAND THE DEMAND FOR FARM AND FOREST PRODUCTS BY DEVELOPING NEW AND IMPROVED PRODUCTS AND PROCESSES AND ENHANCING PRODUCT QUALITY

401 New and Improved Forest Products .....
402 Production of Fruit and Vegetable Crops with Improved Acceptability.
403 New and Improved Fruit and Vegetable Products and Byproducts .....
404 Quality Maintenance in Storing and Marketing Fruits and Vegetables .
405 Production of Field Crops with Improved Acceptability .....

406 New and Improved Food Products from Field Crops .....
407 New and Improved Feed, Textile, and Industrial Products from Field Crops .....
408 Quality Maintenance in Storing and Marketing Field Crops .....
409 Production of Animal Products with Improved Acceptability .....

410 New and Improved Meat, Milk, Eggs, and Other Animal Food Products ..
411 New and Improved Non-Food Animal Products .....
412 Quality Maintenance in Marketing Animal Products .....

RPA	Title
	GOAL V: IMPROVE EFFICIENCY IN THE MARKETING SYSTEM
501	Improvement of Grades and Standards-- Crop and Animal Products.....
502	Development of Markets and Efficient Marketing of Timber and Related Products .....
503	Efficiency in Marketing Agricultural Products and Production Inputs*.
506	Supply, Demand and Price Analysis- Crop and Animal Products .....
507	Competitive Interrelationships in Agriculture .....
508	Development of Domestic Markets for Farm Products .....
509	Performance of Marketing Systems .....
510	Group Action and Market Power .....
511	Improvement in Agricultural Statistics .....
512	Improvement of Grades and Standards of Forest Products .....
513	Supply, Demand and Price Analysis--Forest Products .....
	GOAL VI: EXPAND EXPORT MARKETS AND ASSIST DEVELOPING NATIONS
601	Foreign Market Development .....
602	Evaluation of Foreign Food Aid Programs .....
603	Technical Assistance to Developing Countries .....
604	Product Development and Marketing for Foreign Markets .....
	GOAL VII: PROTECT CONSUMER HEALTH AND IMPROVE NUTRITION AND WELL-BEING OF THE AMERICAN PEOPLE
701	Insure Food Products Free of Toxic Contaminants Including Residues Agricultural and Other Sources .....
702	Protect Food and Feed Supplies from Farmful Microorganisms and Naturally Occurring Toxins .....
703	Food Choices, Habits, and Consumption .....
704	Home and Commercial Food Service .....
705	Selection and Care of Clothing and Household Textiles .....
706	Control of Insect Pests of Man and His Belongings .....
707	Prevent Transmission of Animal Diseases and Parasites to Man .....
708	Human Nutrition .....
709	Reduction of Hazards to Health and Safety .....
	GOAL VIII: ASSIST RURAL AMERICANS TO IMPROVE THEIR LEVEL OF LIVING
801	Housing .....
802	Individual and Family Decision Making and Resource Use and Family Functioning .....
803	Causes of Poverty Among Rural People .....
804	Improvement of Economic Potential of Rural People .....

*This RPA incorporates research formerly included under RPA's 503, 504, and 505.

RPA | Title

GOAL VIII (continued)

805 Communication and Education Processes .....
806 Individual and Family Adjustment to Change .....
807 Structural Changes in Agriculture .....
808 Government Programs to Balance Farm Output and Market Demand .....

GOAL IX: PROMOTE COMMUNITY IMPROVEMENT INCLUDING DEVELOPMENT OF BEAUTY, RECREATION, ENVIRONMENT, ECONOMIC OPPORTUNITY, AND PUBLIC SERVICES

901 Alleviation of Soil, Water and Air Pollution and Disposal of Wastes .
902 Outdoor Recreation .....
903 Multiple Use Potential of Forest Land and Evaluation of Forestry Programs.....
904 Fish and Other Marine Life, Fur-Bearing Animals and Other Wildlife ..

905 Trees to Enhance Rural and Urban Environment .....
906 Culture and Protection of Ornamentals and Turf .....
907 Improved Income Opportunities in Rural Communities .....
908 Improvement of Rural Community Institutions and Services .....

APPENDIX TABLE 2

Research Program Goal	Research Program Unit	Research Problem Area 1/
Research Category (1) NATURAL RESOURCES AND ENVIRONMENTAL QUALITY		
I Renewable Natural Resource Conservation and Management	I-A Improvement of Quality and Quantity of Forest and Range Production	111, 112, 301, 903
	I-B Inventory and Appraisal of Land, Air, and Water Resources	101, 102, 104, 109, 110, 113
	I-C Conservation and Management of Land, Air, and Water Resources	103, 105, 106, 107, 108
II Environmental Enhancement and Recreation	II-A Management of Wildlife and Fisheries	904
	II-B Outdoor Recreation	902
	II-C Using Plants to Enhance the Environment	905, 906
	II-D Environmental Pollution	214, 901
Research Category (2) COMMERCIAL AGRICULTURE -- PRODUCTION, PROCESSING, AND MARKETING		
III Production Capacity and Efficiency of Domestic Plants and Animals	III-A Physical and Economic Aspects of Production Systems	302, 303, 306, 309, 313, 314, 315, 316, 317
	III-B Improvement of Quality and Quantity of Field, Fruit, and Vegetable Crops	304, 305, 307, 308, 402, 405
	III-C Improvement of Quality and Quantity of Domestic Animal Production	310, 311, 312, 409
IV Product Improvement and Marketing	IV-A Analysis of Market Demand and Market Performance	502, 503, 505, 508, 509, 510, 511, 513, 601, 604, 608
	IV-B Product Improvement -- Processing, Storage, and Standards	401, 403, 404, 406, 407, 408, 410, 411, 412, 501, 512
V Protection of Plants and Animals	V-A Control of Insects Affecting Plants	201, 204, 207
	V-B Control of Plant Diseases	202, 205, 208
	V-C Protection of Domestic Animals and Wildlife	210, 211, 212, 213
	V-D Control of Weeds and Wildfire	203, 206, 209
Research Category (3) PEOPLE-ORIENTED RESEARCH -- CONSUMER, FAMILY, AND COMMUNITY		
VI Family and Consumer Welfare	VI-A Consumer Choice	703, 705, 801, 802, 805, 806
	VI-B Health and Safety	701, 702, 706, 707, 709
	VI-C Food and Nutrition	704, 708
VII Community and Economic Development	VII-A Foreign Economic Development	602, 603
	VII-B Regional and Community Economic Development	507, 803, 804, 807, 907, 908
Research Category (4)		
VIII Disciplinary	VIII-A Disciplinary Research	318, 114

1/ These RPA's are described in detail in United States Department of Agriculture Manual of Classification of Agricultural and Forestry Research (CRES) Washington, D.C., June 1970. This is necessary for Federal reporting purposes. Thus, the research activities of the University are not necessarily defined by or restricted to the specific definitions contained in the descriptions of RPA's.

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